

Southeast Region

The natural resource management program at Mammoth Cave NP received well-deserved recognition recently, when its staff swept all three of the Southeast Region Natural Resource Awards, and Supt. Dave Mihalic was named the Director's Superintendent of the Year for Natural Resource Stewardship.

Mammoth Cave Resource Mgt. Chief Jeff Bradybaugh earned the Region's Natural Resource Management Award. He has fostered a solid scientific approach to understanding the resources of Mammoth Cave NP, and has designed a comprehensive research program involving partnerships with universities, agencies, organizations, and individuals; he has professionalized the Division of Science and Resource Management and has coordinated an interagency effort to develop a program focused on protection of groundwater integral to cave resources.

Joseph Meiman was the Region's winner in the research category. Joe has sought to protect the integrity of the subsurface ecosystem of Mammoth Cave NP and the surrounding International Biosphere Reserve. Focus has been on the strategic acquisition of scientific information necessary to demonstrate impacts on groundwater quality and understand the mechanics of pollutant transfer. He has designed and completed numerous scientific studies since being hired in 1989.

Mihalic has addressed park resource management issues from a sustainable ecosystem perspective throughout his tenure at Mammoth Cave. In addition to initiation of an International BR, he has worked to protect, manage, and resolve issues affecting the aquatic ecosystem and has participated in local programs to improve the general welfare, health, and economy of the rural Mammoth Cave area. Supt. Mihalic and the park have received national recognition for these efforts in the form of the 1993 "Innovation Award" from the National Association of Development Districts.

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Virgin Islands NP reports that 17 permanently buoyed anchors have been placed to reduce anchor damage to marine benthic communities. The U.S. Navy is assisting the park in installing 17 to 23 additional moorings. The park also has closed two bays on the south shore to anchoring. The "mooring only" areas allow visitor use while protecting important research sites, seagrass beds, and the endangered green sea turtle that feeds on seagrass.

The park also has established a DOS based GIS system manipulated by IDRISI and Arc-Cad software. Several major themes are digitized and ready for use, including vegetation, elevation, marine benthic communities, historic structures, archeological sites, endangered species, and transportation. Contacts for more information on the mooring program or the GIS system are Jennifer Bjork and Tom Kelley of Virgin Islands NP.

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Recently published reports:

Boulay, M.C. 1992. *Mortality and Recruitment of White-Tailed Deer Fawns in the Wet Prairie/Tree Island Habitat of the Everglades*. Master's thesis, U/FL, Gainesville.

Miller, K.E. 1993. *Habitat Use by White-Tailed Deer in the Everglades: Tree Islands in a Seasonally Flooded Landscape*. Master's thesis, U/FL, Gainesville.

Sargent, R.A. 1992. *Movement Ecology of Adult Male White-Tailed Deer in Hunted and Non-Hunted Populations in the Wet Prairie of the Everglades*. Master's thesis, U/FL, Gainesville.

Zultowsky, J.M. 1992. *Behavioral and Spatial Ecology of Female White-Tailed Deer in the Everglades Ecosystem*. Master's thesis, U/FL, Gainesville.

Western Region

A recent publication by Dr. Lisa Graumlich (Professor at the Laboratory of Tree-Ring Research and Director of the Institute for Study of Planet Earth at U/AZ), "A 1000-Year Record of Temperature and Precipitation in the Sierra Nevada" (*Quaternary Research*, 1993; 39:249-255) has attracted attention with its documentation of extensive drought periods during previous centuries. Summaries of her findings and their possible implications for both park ecosystems and State water supplies were covered by local newspapers and by the *New York Times*. Dr. Graumlich is a principal investigator on the Sierra Nevada global change research program.

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Research Scientist David Parsons has been asked to serve on an ad hoc committee on ecosystem management by the Ecological Society of America (ESA). NPS representation in such activities is critical in building the credibility of NPS science activities as well as in assuring the results of the committee are applicable to park issues. Dr. Parsons also has been asked to serve as a member of an independent science team appointed to as-

sess the current status and management alternatives for old growth and associated ecosystems of the Sierra Nevada. This study is mandated by Congressional legislation.

Parsons continues to serve on the Board of Editors for the ESA journal, *Ecological Applications*, which is interested in publishing more articles related to NP resource issues. Potential contributors can contact Parsons at Sequoia and Kings Canyon NPs. Parsons currently is working on a special series of papers on threats to wilderness and parks, to be published in a special issue co-edited by David Cole of the USFS Wilderness Research Institute in Missoula, MT.

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Under the direction of Dr. Bill Halvorson, the U/AZ CPSU has published *Proceedings of the Fourth California Islands Symposium*. The symposium was held March 23-25, 1993 in Santa Barbara, CA. Copies may be purchased from the Santa Barbara Natural History Museum, 2559 Puesta del Sol Road, Santa Barbara, CA 93106, (805) 682-4711.

The following articles by A/AZ CPSU staff have been accepted for publication:

Christopherson, Gary L., D. Phillip Guertin, Michael R. Kunzmann, Kenneth L. Kvamme, and Thomas Potter, (1993). "Comparison of interpolation algorithms for digital elevation model generation and subsequent watershed analysis," IN *Proceedings of the First Biennial Conference on Research in Colorado Plateau NPs*, pp 226-233. Available through NAU-CPSU, ISSN 0270-8655.

Kunzmann, Michael R., Peter S. Bennett, and R. Roy Johnson. "Riparian Ecosystems: Values and Functions," IN *Altered, Artificial, and Managed Wetlands: Agriculture and Forestry*, Proceedings of the Assn. of Wetland Managers, Berne NY.

Kunzmann, Michael R., Lee A. Graham, and Dana M. Slaymaker. "Cost effective global positioning systems and geolink field data acquisition techniques and applications in Arizona NPs and Wildlife Refuges," IN *Third International CPS/GIS Conference*, Seattle, WA, June 23-25, 1993. Available through GeoResearch Inc., Billings, MT.

Kunzmann, M.R. and P.S. Bennett, "Suppression of Saguaro cactus flower bud formation by roosting vultures in Arizona." *Southwest Naturalist*.

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Dr. George Ball and Michael Kunzmann received a research grant from Southwest Parks and Monuments to continue work on the "Analysis of historic fire data using spatial modeling techniques for Chiricahua National Monument."

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Development of a prototype social science research plan is one of the Western Region's exciting new starts. Project workers include Bill Halverson, Jim Holland, Donna Chickering, and Liudyte Novickis. Their project is scheduled for summer completion.

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For one of the liveliest accounts of ongoing research and resource management anywhere in the Service, read Joan Ford's regular column in *Bajada*, published (and free) three times a year by the NBS CPSU at U/AZ. Ford is an administrative clerk for the CPSU and obviously in touch with everything going on around there.

Mid Atlantic Region

Tom Blount, Shenandoah NP I&M Program Manager, along with four cooperating researchers from U/VA, presented papers at the Mid Atlantic Highlands Environmental Monitoring and Assessment Conference in Hershey, PA Feb. 23-25. Session topics included an overview of progress on the park's Long-term Ecological Monitoring Program and trend information gained from analysis of aquatic resource datasets.

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Research and Resource Planning Division of Delaware Water Gap NRA and the Delaware River Basin Commission (DRBC) met with representatives of NC/State/U's Computer Graphics Center to continue development of a water quality model for the entire upper Delaware basin—over 4,000 square miles. This model will allow analysis of the effect on water quality of proposed developments within any of the more than 70 tributary watersheds in the upper Delaware basin.

The model will be linked to the Delaware Water Gap NRA's GIS at Peirce House. This linkage will allow examination of the effects of potential threats to the Delaware water quality anywhere in the upper basin, and will be a means by which water quality and resource management specialists, under the auspices of the DRBC Special Protection Waters program, can conduct long-term areawide water quality management.

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A pre-settlement-origin chestnut oak forest in French Creek State Park, adjacent to the Hopewell Furnace NHS boundary, was discovered in the course of a recent research project. The study investigated the community ecology of an old growth chestnut oak forest on a dry talus slope. Chestnut oaks up to 367 years old dominate the canopy layer.

Ironically, this community is situated near the center of a 19th Century charcoal iron settlement, where area forests repeatedly were clearcut on short rotations for fuel.

This discovery permitted the construction of a 367-year living tree-ring chronology, which may be used in the future dating of historic structures at Hopewell Furnace NHS.

Pacific Northwest

On February 3, PNR representatives met with conservation organization leaders to discuss "Nature Has No Borders," the March 25-27 Conference on the Protection and Management of the Northern Cascades Ecosystem, on the U/WA campus in Seattle.

At that meeting, the Freeman Tilden Award was presented to Barb Maynes, District Interpreter at Olympic NP, and the Tilden Sponsorship Award was given to Supt. Maureen Finnerty for supporting interpretation activities at Olympic.

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Fort Clatsop National Memorial Supt. Cynthia Orlando was in Washington, DC the last week of January to brief the Oregon Congressional delegation on the draft General Management Plan/EIS for Fort Clatsop.

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Assoc. Reg. Dir. Mike Tollefson attended a January meeting in Virginia, called by Destry Jarvis, to help the NPS develop a Public Land Corps program, part of the National Service Corps, slated to be in place by this summer.

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The Region has been asked by the Student Conservation Assn. to help SCA put on "Earth Week Seattle" May 21, 1994. Regional Chief Ranger Reed Jarvis has been assigned as the Region's representative on the SCA steering committee. NPS will be a partner in providing logistical and staff support and will assist at some of the 1,000 proposed work sites in the City of Seattle. Focus of the event is to unify communities in urban environmental restoration and beautification projects while creating your-round support for SCA's education and work program.

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Managers from Olympic NP, Olympic NF and the WA Dept. of Natural Resources met Jan. 20-21 in Port Angeles, WA. The meeting, whose theme was "Reinventing Government on the Peninsula," afforded managers a chance to become better acquainted with one another's programs and to discuss ecosystem management, interagency cooperation, and providing better public service.

Southwest Region

The SWR's Division of Natural Resources held a week-long Resource Management Workshop in January. Over 130 attendees heard presentations on topics such as compliance and consultation, resource stewardship, the interrelationships between natural and cultural resources, how to write good proposals and project statements for park resource management plans, information on funding sources, and the role of Geographic Information Systems in resource management.

Maria Burks presented a session on resource stewardship and the Vail Agenda; Deputy Regional Director Mary Bradford opened the workshop with a talk on her views of resource management as part of park management and the relationship between the parks and the regional office; and David Simon, the keynoter, spoke on the purpose and role of the National Parks and Conservation Association and its administrative and legislative agendas.

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On January 31, the New Mexico State Director for the BLM signed a Record of Decision for the Dark Canyon Environmental Impact Statement. This EIS was prepared by BLM to assist them in deciding how to manage oil and gas leases adjacent to Carlsbad Caverns NP near the known passageways of Lechuguilla Cave. NPS was a cooperating agency in preparation of the EIS.

The decision made by BLM was endorsed by NPS; it sets a new standard for protection of cave resources by BLM. A cave protection zone was established and drilling for oil and gas in this zone will not be permitted. Outside this zone, special precautionary measures for oil and gas activities will be required. These measures also will be used by BLM in other karst areas to protect cave resources.

Midwest Region

In an effort to understand some of the more subtle, yet important, anthropogenic impacts on parks, Walt Loope, Research Ecologist focused on one lake in Pictured Rocks National Lakeshore to determine how it had been altered by placement of a lowhead dam across the outlet. The dam was installed in the early 1900s to raise creek and lake levels in order to float logs to Lake Superior.

He found that many of the lake's characteristics, previously attributed to natural phenomena, probably were caused by the dam. The report, titled "Evidence of Physical and Biological Change Within the Beaver Lake

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Regional Highlights

Watershed Attributable to a Turn-of-the-Century Logging Dam," can be had by contracting Brian Kenner at Pictured Rocks, (906)387-2607.

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All monitoring efforts in 1993 indicated that zebra mussels did not become established in waters of the Saint Croix National Scenic Riverway...an unexpected but very welcome outcome of the 1993 zebra mussel response program. The 1994 program, supported by a special appropriation from Congress, will include a critically needed assessment of the zebra mussel risk along the 405-kilometer length of the St. Croix. The limited information available in scientific literature indicates that at least the upper reaches of the river may not have high enough levels of calcium to allow for zebra mussel establishment. Water quality characteristics of the St. Croix will be mimicked in lab tank studies to assess the risk of zebra mussel colonization in various reaches of the river.

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Twenty-nine Region employees attended the Geographic Information Systems October 1993 workshop at the GIS Field Technical Support Center (FTSC) at the U/WI-Madison. The workshop aimed to establish common ground for building a Regional GIS program. One goal of the FTSC is to involve knowledge and expertise at U/WI-Madison in park issues and projects, and toward this end workshop participants made presentations open to the university community on the cultural, natural, and recreational resources of their parks and the issues facing them.

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Regional Chief Scientist Ron Hiebert met with the Natural Resource Advisory Board for Haskell Indian National University Nov. 2-3 in Lawrence, KS, where the contributions of two NPS cooperative education enrollees and two interns from Haskell were recognized in an award ceremony.

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Dr. Robert Brander retired from the NPS Nov. 12, 1993. At a farewell dinner in Washburn, WI, on Nov. 9, he was presented with the Dept. of the Interior Meritorious Service Award for major contributions in ecosystem management and inter-agency/international cooperation. He will continue to work, as a re-employed annuitant, on special designations—a part of the Lake Superior Binational working group.